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## CASE OF RAPID LITHOTRITY, WITH REMARKS ON BIGELOW'S OPERATION.\*

BY JAMES F. WEST, F.R.C.S.,  
SENIOR SURGEON TO THE QUEEN'S HOSPITAL, BIRMINGHAM.

THE subject of rapid lithotripsy is one which is at present deservedly exciting considerable attention. Such a case as that recorded by Mr. Reginald Harrison at the recent Worcester meeting of the British Medical Association, where a stone weighing over two ounces was removed at a single sitting, together with others which have been brought forward in this room, or which have been published in the various medical journals during the past few years, induce one to look upon Bigelow's operation as one of the greatest improvements in modern surgery. You will observe that I do not make use of the newly-coined term, *litholopaxy*, which has been given to this operation. By adopting it I should assent to the idea that to Prof. Bigelow belonged the credit of washing out the fragments from the bladder; this, we all know, was previously done, though less perfectly, by Clover's instrument, which has been in use by all lithotritists for many years. To Bigelow belongs the credit of doing at one sitting what previously was done at four or five, of leaving no fragments whatever to irritate the bladder, and for that discovery he is entitled to very high commendation. To call it lithotripsy at a single sitting would in my judgment be far better than to call it by so unsuitable a word as litholopaxy.

I have recently had under my care a man with a lithic

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\* Paper read at the Birmingham and Midland Counties Branch of the British Medical Association, on Nov. 9th, 1882.

acid stone as big as a hen's egg, and weighing upwards of two ounces, on whom I have operated successfully; and his case, in my opinion, deserves to be placed on record. I certainly thought that it would have been better for this patient to have submitted to lithotomy, and I accordingly recommended that operation, as the calculus was large, and had probably been in existence upwards of three years. He, however, refused to be cut, and so I had no alternative but to perform lithotrity, though I did so with considerable hesitation, as I had never attacked so large a stone by crushing before, and my past experience had taught me that with increase of size there came also increase of risk. In four sittings I managed to get away the whole of the stone, and within a month of the first crushing the patient was able to leave the hospital, without a symptom of stone, and with his bladder in so healthy a state that he could go for seven or eight hours without relieving it, and with his urine free from any kind of deposit.

Edward S—, æt. 42, glassmaker, living at West Bromwich, was admitted into the Queen's Hospital, June 6th, 1882, under the care of Mr. West. There was no history of calculus in the family. Patient first noticed pain at the end of the penis three years ago, but took no notice of it. He went to America twelve months ago, and then first complained that on being shaken his urine became of a chocolate colour, and that severe pain came on in the penis.

*On admission* his general condition was found to be good, and his urine free from pus and albumen. His temperature was 100°.

June 8th.—On examination a calculus as large as a hen's egg was found in the bladder, for the removal of which the patient refused to submit to lithotomy.

June 10th.—He was put under ether, and the operation, as described by Bigelow, was performed ; the stone being crushed fifty times, and the weight of it evacuated 101 grs.; the operation lasted an hour and twenty minutes. Evening temperature 103°.

June 11th,—Temp. 103°. During the night patient had a rigor, was restless, and in great pain. He had some fragments, which were impacted in the urethra, removed by Mr. Sanders, the house surgeon.

June 13th.—Patient had a rigor during the night. Temp. 100°.; he also passed some fragments of stone.

June 15th.—Second operation, under ether, as before. Stone crushed fifty times, weight of stone evacuated 192 grs. Time of operation an hour and three quarters. Evening temp. 100°.

June 17th.—He has passed very good nights since the last operation, but has some conjunctivitis and herpes from the irritation caused by the ether. From 1 to 200 grs. of calculous material have passed easily during urination.

June 22nd.—Third operation, lasting one hour and three quarters. The remaining fragments were crushed fifty times. No evacuation could be effected owing to an accident to the aspirating instrument.

June 24th.—The bladder was washed out with warm carbolic water 1—100; patient passed a good night. Weight of fragments of stone passed 106 grs. Urine acid.

June 30th.—Patient passed a bad night ; had a rigor : the cause being a large fragment of stone, which was removed from the urethra by the House Surgeon.

July 1st.—Fourth and last operation. Stone crushed sixty times. Time of operation, one hour and a half.

July 4th.—Patient much better. Passes very good nights.

July 10th.—Patient sounded, *no* fragments could be felt.

July 12th.—Bladder washed out, but no débris came away. Patient slept eight hours consecutively; he says he is now free from pain, and has no difficulty in urination.

July 13th.—*Patient discharged cured.*

The discussion, which took place at the International Medical Congress in London, last year, following the papers of Sir Henry Thompson, Dr. Bigelow, of Boston, Dr. Theophile Augier, of Paris, and Mr. Reginald Harrison, of Liverpool, showed that the old views that had been entertained as to the shortness of the sittings and leaving the fragments to be expelled by nature, had been almost completely given up, and on the other hand, there was a general expression of opinion that the bladder will permit, without injury, a large amount of manipulation, and that the crushing operations may occupy a length of time which, a few years ago, would have been deemed unjustifiable, and even incredible. The merits of Dr. Bigelow's operation are unquestionably great, and it marks a new era in this department of surgery. His large catheters (though not his largest size), whether straight or curved, and his evacuating apparatus, are excellent. I cannot give the same meed of praise to his lithotrite. It is heavy, large and cumbrous, and can, I think, do no more as an effective crushing agent than Sir H. Thompson's instrument, as made by Weiss. Fenestrated lithotrites are, in my opinion, much better than solid. The danger of a projecting splinter of stone is not great, if the fenestra be sufficiently large, while, in the removal of a solid lithotrite, clogged with débris, we may easily lacerate the urethra. Bigelow's evacuator-stand is a useful adjunct to the operation, as the hand

gets tired of holding the india-rubber bottle during a long operation. I have never seen the instrument figured in Dr. Reliquet's pamphlet\* on this subject in use, and which he calls the "aspirateur Clover modifié par Nelaton et Collin," but as it acts on the same principle as the well known irrigator enema apparatus, I think it would very likely be both handy and serviceable as an evacuator.

The great question of difficulty in Bigelow's operation is how long should the operation be prolonged : we can readily understand operations lasting from half an hour to an hour without inflicting any great risk on the patient, but can they, as Bigelow says, "be successfully extended to three hours or more?" Anæsthesia produced first by laughing gas and subsequently by ether, as practised by Mr. Clover, which is probably the safest way of effecting it, can hardly be kept up so long without danger ; and I cannot help thinking that if the operation should exceed in duration an hour, or an hour and a half, it is better for the patient that he should be removed to bed, and that a second or even third operation should be undertaken at intervals of two or three days.

The frequency with which fragments obstruct the urethra after lithotrity, and the rigors and constitutional excitement to which such impactions give rise, warn us that it is necessary to be near the patient, or to have a skilled assistant at hand to remove, with forceps, any pieces that may have lodged in the anterior part of the urethra, or to push back into the bladder, with a large staff, any fragment that may have stuck in the prostatic portion of the urethra.

That there is great risk to the patients in the passage of large fragments along the urethra there can be no

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\* De la Lithotritie Rapide, Paris, 1882 (page 49).

doubt, and possibly, many of the fatal cases which have been thought to be due to laceration of the urethra caused by the introduction or removal of the lithotrites have been due to that cause.

I may here quote, as an instance, a case occurring in the practice of Professor Billroth of Vienna, and also his remarks on it which are very apposite.

Death after lithotrity (reported at p. 273 of Billroth's Clinical Surgery, published by the New Sydenham Soc., 1881).—"L. M., æt. 24, had a rather hard stone in the bladder, measuring two and a half by three and a half centimetres. After the first sitting, numerous sharp-edged fragments were passed. The bladder contracted spasmodically on the instrument, and occasioned so much pain that an anæsthetic was given; even when he was completely narcotised, the spasms still occurred. The evening after the second sitting, the patient suffered most intense pain; symptoms of cystitis and peritonitis developed, and he died two days later. At the *post mortem*, the wall of the bladder was found obliquely perforated, close to the neck. The shape of the opening showed clearly that it had not been caused by the lithotrite; I think it could only have been due to a sharp fragment of the calculus, pressed against the wall during a spasmotic contraction of the bladder.

"A calamity of this nature—one that may arise whenever the stone is hard—should remind us that lithotrity is not perfectly free from risk, even when the utmost caution is exercised. Still, such occurrences are not of sufficient frequency to interfere with the favourable prognosis which can be given in lithotrity as against lithotomy. The case showed further, that even deep anæsthesia is not always sufficient to obviate spasmotic action of the bladder. In this patient the contraction

was so strong that I found it impossible to move the instrument."

The current of surgical opinion sets at the present time strongly in favour of lithotrity by a single long sitting, but will it always remain so? We must not forget that Civiale (*Traité de la Lithotritie*, 1847, page 278), began by practising sittings of half an hour's duration, but after a time gave them up and reduced the sittings to five or ten minutes, and that after doing so, he observed that the operation was much less rarely followed by an access of febrile symptoms, by consecutive pains, nervous excitement, and by frequent desire to make water. Sir Henry Thompson, during many years of successful practice, performed short and frequent crushings, and it is only within the last two or three years that he has modified his views, and even now he enjoins us "always to remove the stone by the smallest possible amount of mechanical action." Large lithotrites and catheters (28-30 French), which are generally used in single crushings, pass with difficulty through the average sized urethra, and the careless or forcible introduction of them, or of any exceptionally large evacuating instrument, may do irreparable damage to the urethra. The points then, that I urge, are that our efforts should be directed to detect the stone early, and to crush it as soon as it is discovered. For small stones, *i.e.*, if not larger than a walnut, I believe, a single crushing with Sir H. Thompson's medium sized fenestrated lithotrite will suffice; the fragments being at once evacuated through a number 12-14 English catheter, made after Bigelow's pattern. On the other hand, if the stone is as large as a hen's egg, crushing, if resorted to in preference to lithotomy, had better not be attempted at a single sitting, the risk of laceration

of the urethra and bladder in a long operation, with large instruments, being too great. In such cases, a second or third sitting at intervals, of some days, according to the condition of the patient, will, as in the case herewith recorded, probably give the best results.

Had the stone in the present instance been dealt with at a single sitting, it would have taken so long a period of time that it would have been unsafe to keep the patient under the influence of any anaesthetic. The absolute time occupied in the four crushings was six hours and twenty minutes, although there was no delay or waste of time during the various operations; my colleagues, especially Mr. Jordan Lloyd, ably assisting me whenever my hands became tired with compressing the aspirating instrument. In conclusion, I would recommend Bigelow's operation to be performed if it can be completed in a reasonable time, say from one to two hours; but if the stone be too large to be crushed and removed by the aspirating syringe in that space of time, I would suggest lithotomy as a preferable expedient; or, that operation being declined by the patient, lithotripsy at two or even more sittings of moderate duration.

